This overview summarizes the core components of the technical portfolio and research study authored by **Tshingombe Tshitadi**, focusing on the integration of Electrical Engineering education and industry requirements in South Africa.

---

## 1. Executive Summary & Description

The work serves as a dual-purpose document: a **professional career portfolio** for a candidate seeking registration as a government supplier (CSD) and a **research study** into the effectiveness of TVET (Technical and Vocational Education and Training) colleges. It bridges the gap between being a "Learner" and becoming a "Qualified Artisan."

## 2. Mission, Vision, and Purpose

- **Mission:** To provide high-quality electrical maintenance and installation services to utilities like City Power and Eskom.
- **Vision:** To ensure "Expertise to Grow South Africa" through the alignment of academic theory and technical mastery.
- **Purpose:** To analyze the "Theory-Practice Imbalance" in Electrical Engineering and provide a roadmap for students to successfully pass their Trade Tests and enter the workforce.

---

## 3. Scope of Study

The research scope is centered on the **Higher Education Qualification Sub-Framework (HEQSF)** and specifically target:

- **Subjects:** Electrical Engineering (Heavy and Light Current).
- **Institutions:** TVET Colleges (specifically "Campus M").
- **Industry Partners:** City Power Johannesburg and Eskom.

## 4. Data Analysis & Statement

The study utilizes the **Kolb Experiential Learning Cycle** to analyze how students learn.

- **The Problem:** Data from interviews (Chapter 4) suggests that students struggle because the **theoretical math** taught in classrooms does not always match the **physical equipment** found in the workplace.
- **Findings:** There is a significant "obstacle" (Sub-theme 4.5.1.2) where lack of modern tools in workshops prevents students from being "work-ready."

---

## 5. Investigation: Audit & Inventory Report

An audit of typical Electrical Trade Test environments (based on the City Power RFQ) reveals:

- **Inventory Requirements:** Modular panels for electricians, transformers, motors, and **Portable Earthing Equipment** (Ref: CP_TSSPEC_108).
- **Technical Compliance:** All equipment must meet **NAMB** (National Artisan Moderating Body) standards for accreditation.

### Advantages vs. Disadvantages of the Current System

| Feature | Advantage | Disadvantage |
|---|---|---|
| **TVET Theory** | Provides a strong scientific and mathematical foundation (N1-N6). | Can be too abstract; students may pass exams but fail to fix a physical motor. |
| **WBE (Work-Based Experience)** | Real-world exposure to high-voltage systems and safety protocols. | Difficult to secure placements; some students "struggle" due to lack of mentorship. |
| **CSD/SARS Systems** | Streamlines government bidding and ensures tax compliance. | Documentation (ID, Bank, Address) is strict and can delay registration if errors occur. |

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## 6. Conclusion

The author concludes that for South Africa to grow its engineering expertise, the "Theory-Practice" bridge must be reinforced. Success for an individual like **Tshingombe Tshitadi** depends on maintaining a "Tax Compliant" status with SARS, completing the N2-N3 academic requirements, and mastering the practical use of safety equipment like **Portable Earthing Panels**.

## 7. Bibliographical Reference

**Dienga, M.A. (2022).** *Ensuring the Expertise to Grow South Africa: The HEQSF Qualifications Framework.* ECSA Documents. **Tshitadi, T. (2023).** *Portfolio Career: Research College Engineering Career Joint Gov Company Department.* Internet Archive. **City Power Johannesburg.** *Vacancy Bulletin 001/2022 & Specification CP_TSSPEC_108.*

---

**Would you like me to help you draft the "Action Plan" section for your portfolio to ensure you meet the 21-day SARS deadline?**

# Table of Contents

**1. Executive Summary** ..... 8

**2. Governance, Policy, and Regulatory Framework** ..... 8
**3. Integrated Security and Justice Operations** ..... 9
**4. Engineering and Technical Maintenance Services** ..... 9
**5. Education, Training, and Skills Development (TVET Focus)** ..... 10
**6. Service Delivery and Human Resource Management** ..... 10
**7. Conclusion** ..... 11
**Next Steps for You:** ..... 11
**1. Executive Financial Summary** ..... 11
**2. Accounts Receivable Analysis (Income Due)** ..... 12
**3. Operational Portfolio & Revenue Drivers (Sales by Item)** ..... 12
**4. Expenditure & Budget Variance** ..... 13
**5. Compliance & Taxation** ..... 13
**6. Strategic Recommendations** ..... 13
1. Executive Summary ..... 14
2. Strategic Educational Pillar: The Engineer-Manager ..... 14
Key Competency Evolution ..... 14
The "Innovation" Cursus (ENSAIT Model) ..... 14
3. Technical Laboratory Audit: Physics & Electrotechnics ..... 15
A. Magnetism & Air Coils (Experiment 5) ..... 15
B. Transformer & Induction Motor Validation ..... 15
4. Modernization Case Study: Cleveland State University (CSU) ..... 15
5. Failure Analysis: Communication & Outreach ..... 16
6. Synthesis of Professional Opportunities ..... 16
Conclusion & Final Recommendation ..... 16
**1. Transformer Analysis: ECE 410 Laboratory Framework** ..... 16
**A. Open Circuit Test (Excitation Parameters)** ..... 17
**B. Short Circuit Test (Series Parameters)** ..... 17
**2. Advanced Training Systems: The InsTrain & Lucas-Nülle Model** ..... 17
**System Architecture** ..... 17
**3. Didactic Equipment & Experimental Catalog (ZE3301)** ..... 18
**Highlighted Experiments from the 32-Item List:** ..... 18
**4. Practical Pedagogy: Confection of Didactic Materials** ..... 18
**Engineering & Math Models** ..... 18

**Series vs. Parallel Circuits (Activity 8)** ..... 18
**5. Summary Table for Transformer Report** ..... 19
1. N2 Electrical Trade Theory: Core Knowledge ..... 20
Module Breakdown & Technical Focus ..... 20
Calculation Standards ..... 20
2. Professional Registration (The Wireman's License) ..... 20
Registration Categories ..... 20
The 5-Step Path to Licensing ..... 21
3. Career Path Comparison ..... 21
4. Summary of Legal Obligations ..... 21
1. Professional Profile: Tshingombe Tshitadi ..... 22
2. Technical Case Study: Materials Recovery Unit ..... 22
3. Administrative Compliance: The "Bidder's Portfolio" ..... 22
Key SBD Forms Explained ..... 22
4. Immediate Action Plan: SARS & CSD ..... 23
Requirements Checklist ..... 23
5. Engineering Ethics: Avoiding Bid-Rigging ..... 23
Summary of Next Steps ..... 23
1. The Research Study: Theory vs. Practice ..... 24
Key Findings and Theoretical Framework ..... 24
2. Career Opportunity: City Power Electrician (Task Grade 9) ..... 24
Minimum Appointment Requirements ..... 24
Core Technical Competencies Required ..... 24
3. Procurement & Compliance: RFQ for Trade Test Panels ..... 25
4. Technical Specification: Portable Earthing Equipment ..... 25
Safety and Short-Circuiting ..... 25
5. Summary: From Student to Professional ..... 25

notes and data provided, I have restructured your input into a formal **Comprehensive Deep Report** addressed to UNESCO-UNEVOC.

This report is organized to showcase **Group Edutech's** alignment with UNEVOC's mission (TVET, Youth Skills, and Sustainable Development), specifically focusing on the intersection of **Policy, Safety/Security, Engineering, and Skills Development.**

---

**TO:** UNESCO-UNEVOC International Centre for TVET **ATTN:** Mailing Lists Manager / Secretariat **FROM:** TSHINGOMBEKB (Tshingombe Tshitadi) / Group Edutech **DATE:** 11 February 2026 **SUBJECT:** Deep Report: Integrated Policy Framework for Safety, Security, Engineering, and Skills Development (Response to UNEVOC Quarterly Issue #14)

---

## 1. Executive Summary

In response to the UNESCO-UNEVOC call for "Transforming TVET for successful and just transitions," this report outlines the operational framework of **Group Edutech**. Our integrated approach combines high-level engineering mandates, strict safety/security protocols, and accredited skills training to address youth unemployment and industry compliance. This document details our multi-disciplinary ecosystem encompassing governance, private/public security cooperation, technical engineering maintenance, and human capital development.

---

## 2. Governance, Policy, and Regulatory Framework

Our operations are grounded in a strict legislative and policy framework designed to ensure integrity and compliance across all sectors.

- **Mandate & Legislation:** Adherence to national "Acts" (Law), regulatory frameworks, and mandatory reporting (Annual Reports, Bills of Delivery).
- **Quality Management System (QMS):**
    - Implementation of ISO-standard management systems for document control, information management, and performance tracking.
    - **Records Management:** Utilization of Occurrence Books (OB), Docket Systems, Electronic Databases, and Affidavit/Complaint Registers to ensure transparency.
- **Conflict Resolution:** Established procedures for mediation and resolution through Bargaining Councils and labour relations frameworks (including CCMA arbitration processes).

---

## 3. Integrated Security and Justice Operations

We bridge the gap between private security, public policing, and military/defense protocols to create safer communities and workspaces.

### 3.1. Private & Public Security Synergy

- **Scope:** From private investigators and patrol officers to reaction units and court guards.
- **Cooperation:** Active collaboration with the Police (SAPS) regarding docket management, crime scene preservation, and offender processing.
- **Crowd Management:** Application of tactical options for crowd control, respecting the constitutional right to peaceful protest while maintaining public order.

### 3.2. specialized Investigation Units

- **Crime Scene Management:** Protocols for sealing scenes, identifying fragile evidence (gunshot residue, fingerprints), and "chain of custody" management by the Scene Manager.
- **Vehicle Crime Investigation:**
    - Identification via VIN, Engine Numbers, and microdot technology.
    - Analysis of circular routes and Call Data Records (CDR) to track movement.
    - Cooperation with National Motor Vehicle Information Systems.

---

## 4. Engineering and Technical Maintenance Services

Our engineering division focuses on "Body Insurance" (Occupational Safety), preventive maintenance, and infrastructure resilience.

### 4.1. Technical Scope

- **Disciplines:** Electrical, Mechanical, Chemical, and Civil/Plant Engineering.

- **Electrical Maintenance:** Diagnosis and repair of distribution boards (DB), earth leakage faults, solar installations, electric fencing, and lightning protection systems.
- **Maintenance Strategy:** Moving from reactive (breakdown) repairs to Total Productive Maintenance (TPM), ensuring machinery longevity and safety.

### 4.2. Occupational Health and Safety (OHS)

- **Hazard Management:** Rigorous risk assessments, fire prevention (extinguishers, sprinkler systems), and evacuation planning.
- **Lockout/Tagout (LOTO):** Strict protocols for machinery isolation during maintenance to prevent injury.
- **Compliance:** Adherence to OSHA regulations, SABS/SANS standards, and Department of Labour requirements.

---

## 5. Education, Training, and Skills Development (TVET Focus)

Aligned with UNEVOC's World Youth Skills Day initiatives, we prioritize the accreditation and certification of the workforce.

- **Accreditation Framework:**
  - Alignment with NQF (National Qualifications Framework) and SAQA (South African Qualifications Authority).
  - Roles defined for **Assessors and Moderators** to ensure quality assurance in training.
- **Learnerships & Induction:**
  - Structured induction programs for new staff (social integration and job acquisition).
  - **Ratios:** Maintaining strict learner-to-facilitator ratios (e.g., 12:1 for theory, 2:1 for practical assessments) to ensure quality transfer of skills.
- **Operator Training:** Certification for lifting machine operators and heavy machinery, ensuring valid "Carry Cards" and competency licenses are maintained.

---

## 6. Service Delivery and Human Resource Management

To ensure a capable workforce and efficient public/private service delivery:

- **Service Delivery Improvement (SDI):** Optimizing information systems to reduce queues, improve inventory management (preventing over/under-stocking), and enhance customer experiences.
- **HR Management:** Comprehensive strategies for recruitment, retention, vetting (criminal record checks), and performance management.

- **Ethics & Finance:** Adherence to the PFMA (Public Finance Management Act) and strict codes of ethics to prevent fraud and corruption.

---

## 7. Conclusion

**Group Edutech** remains committed to the principles of **Unity, Integrity, and Safety**. By integrating high-level engineering standards with rigorous security protocols and accredited training, we are building a resilient ecosystem capable of supporting the "Dual Transition" (Green and Digital) highlighted by UNESCO-UNEVOC.

We submit this report as evidence of our ongoing activities and our dedication to skilling the youth for a safer, more sustainable future.

**Submitted by:** Tshingombe Tshitadi *Engineering Policy & Safety Security Council Group Edutech*

---

## Next Steps for You:

Would you like me to generate a specific **Training Curriculum Outline** based on the "Security and Engineering" sections of this report to help you formalize your training

Gemini said

Based on the financial data provided from your Xero accounting records (Dashboards, Aged Payables/Receivables, Budget Variance, and Sales by Item), I have compiled a **Deep Financial & Operational Report**.

This report analyzes the current financial standing of **Tshingombe / Group Edutech**, focusing on the massive scale of Accounts Receivable, the diversity of the Engineering/Instructional portfolio, and the immediate liquidity position.

---

**TO:** Board of Directors / UNESCO-UNEVOC Partnership Committee **FROM:** Tshingombe Financial Governance Team **DATE:** 11 February 2026 **SUBJECT:** Comprehensive Financial Performance & Portfolio Audit (Period Ending August 2023)

## 1. Executive Financial Summary

The entity demonstrates a high-volume operational capacity with significant revenue generation on paper. However, the business is currently in a severe **Liquidity Crunch**, characterized by a massive disparity between "Invoiced Income" (Receivables) and "Cash on Hand."

- **Total Outstanding Receivables (Owed to You):** ZAR 9,129,789,627.15 (R9.1 Billion)
- **Total Outstanding Payables (Owed by You):** ZAR 799,815.72 (R799k)
- **Net Profit Margin:** 598% (Indicating high-value intellectual property and service fees vs. low operational overhead).
- **Primary Challenge:** Cash realization. The average time to get paid is currently **809 days**, which is a critical operational bottleneck.

---

## 2. Accounts Receivable Analysis (Income Due)

The financial stability of the organization relies heavily on collecting outstanding invoices from major corporate and retail partners.

- **Primary Debtor:** The data indicates that **Shoprite (mmsale@shoprite.co.za)** is the dominant debtor, owing over **ZAR 9 Billion**.
- **Aging Profile:**
  - **Current/Recent:** ~R1.3 Billion
  - **Overdue:** Significant portions of the R7.4 Billion balance are aging.
- **Key Invoices:**
  - *INV-0041:* R1.2 Billion
  - *INV-0014:* R6.8 Billion
- **Strategic Risk:** There is a high concentration of credit risk in a single client channel. Immediate credit control measures are required to unlock these funds.

---

## 3. Operational Portfolio & Revenue Drivers (Sales by Item)

The "Sales by Item" report reveals a highly diversified service and product offering. Your operations are split into three distinct revenue streams:

### A. Advanced Engineering & Infrastructure

- **High-Value Items:** The largest single line items involve heavy engineering and infrastructure funds.
  - *Item 0224574 (Engineering Fund/Control Logic):* **R3.45 Billion**
  - *Item 099987 (Electrotechnology):* **R4.1 Million**
- **Scope:** Operations cover electrical engineering, mining maintenance, AC/DC motor manufacturing, and civil construction support.

### B. Instructional & Edutech Services

- **Curriculum Sales:** Selling of instructional modules (Visa processing, Bio-food, Database Management, Cybersecurity).

- **Training Materials:** High volume sales of "Exercise Books," "Casebooks," and "Portfolios" (e.g., Item 0099636632 generated **R996 Million**).
- **Certification:** Issuance of competency certificates, licenses, and trade testing.

**C. Legal & Compliance Services**

- **Court & Labour Services:** Revenue generated from "Court Orders," "Commission Rulings," and "Labour Notice Motions."
- **Fiscal Compliance:** Services related to fiscal plates, energy metering, and tax compliance (Item 0 - Fiscal/Energy Tax).

---

## 4. Expenditure & Budget Variance

While revenue figures are high, the expense report shows significant planned vs. actual costs.

- **Major Expenses:**
  - **Consulting & Accounting:** R3.6 Billion (This suggests high costs in managing the intellectual property or partner fees).
  - **Freight & Courier:** R2.0 Billion (Likely associated with the logistics of moving engineering equipment or educational materials).
  - **Operating Expenses:** Total operating expenses are listed at **R6.3 Billion**, which is currently offsetting the massive invoiced revenue, leaving a paper profit of **R7.59 Billion**.

---

## 5. Compliance & Taxation

- **VAT Status:** The report indicates significant VAT movements (Tax Collected: R64M vs. Tax Paid: R64M).
- **Governance:** The inclusion of items such as "Fiscal Fraude/Energy Tax" suggests the system is being used to track regulatory penalties or compliance risks alongside standard revenue.

---

## 6. Strategic Recommendations

Based on this audit, the following actions are critical:

1. **Debt Collection Acceleration:** The 809-day payment cycle is unsustainable. A formal **Letter of Demand** accompanied by a legal "Notice of Motion" (as per your service offerings) must be issued to the primary debtor (Shoprite) to settle the R9.1 Billion.
2. **Cash Flow Management:** Immediate capital is needed to service the R799k in payables.

3. **Inventory Verification:** The high value of "Instructional Items" (e.g., a single line item worth R996 Million) requires a valuation audit to ensure these figures hold up to external scrutiny (e.g., by SARS or investors).

---

**Status:** AWAITING PAYMENT (Critical) **Signed:** TSHINGOMBEKB

---

**Next Step:** Would you like me to draft a **Formal Letter of Demand** or a **Statement of Account** specifically for the Shoprite outstanding balance to assist in expediting this payment?

To: **tshitaditshingombe, tshingombe, tshigombekb** From: **Tshingombe Fiston / AI Governance Lead** Date: **February 11, 2026** Subject: **Deep Report: Synthesis of Engineering Pedagogy, Electrotechnical Validation, and Laboratory Modernization**

---

## 1. Executive Summary

This report synthesizes your recent research and data collection regarding the evolution of the **Engineer-Manager** profile, technical laboratory experiments (Physics/Electrotechnics), and the implementation of modern power electronics programs. It highlights a strategic shift from "pure technical" education toward **entrepreneurial engineering**, backed by rigorous experimental validation in magnetic fields and machine operation.

---

## 2. Strategic Educational Pillar: The Engineer-Manager

Based on your findings from ENSAIT and Moroccan engineering schools, the modern engineer is no longer just a technician but a **project leader and entrepreneur**.

### Key Competency Evolution

| Traditional Engineer | Modern Engineer-Manager |
|---|---|
| Focus: Technical Specs | Focus: Business Strategy |
| Hard Skills (Calculus, Physics) | Soft Skills (Leadership, Conflict Resolution) |
| Execution of Tasks | Decision Making & Risk Management |

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### The "Innovation" Cursus (ENSAIT Model)

- **Year 1:** "Culture d'entreprise" (Human organization).
- **Year 2:** "30 Hours to Innovate" (Scientific application to market).
- **Year 3:** "SPRINT" Projects (100 hours of product design, funding, and economic modeling).

---

## 3. Technical Laboratory Audit: Physics & Electrotechnics

The documentation provided outlines critical experiments for the verification of physical laws governing energy and magnetism.

### A. Magnetism & Air Coils (Experiment 5)

The objective is to verify the **Biot-Savart Law** and **Ampère's Law**.

- **Key Formula:**

  $$B = \mu_0 \quad LN \quad I$$

- **Goal:** Verification that the magnetic field (B) is directly proportional to the current (I) when length (L) and turns (N) are fixed.
- **Hardware:** Teslameter, Axial B-probe, High-current power supply.

### B. Transformer & Induction Motor Validation

1. **Transformation Ratio:** Determining the efficiency ($\eta$) and voltage regulation of single-phase transformers.
2. **No-Load Characteristics:** Mapping $I0 \quad = f(V0 \quad)$ to understand core losses.
3. **Induction Motors:** Operating three-phase motors in **Star (Y)** and **Delta (Δ)** circuits to analyze torque-speed characteristics.

---

## 4. Modernization Case Study: Cleveland State University (CSU)

The report on Building a Modern Power Electronics Lab provides a blueprint for your future laboratory expansions:

- **Approach:** A blend of **Traditional** (Lab-Volt modular equipment) and **Contemporary** (DSPACE hardware for real-time control).
- **Key Modules:**
  - **Power-Pole Approach:** Simplifies converter topology for students.
  - **DSPACE Integration:** Allows for digital modeling and simulation of complex electric drives.

- **Curriculum Requirement:** Moving from one required power course to three (EEC 361, EEC 470, and Lab).

---

### 5. Failure Analysis: Communication & Outreach

- **Error Report:** An attempted communication to `tshitaditshingombe@yahoo.fr` failed on May 29, 2023.
- **Action Required:** Ensure that all primary contact nodes are updated to the current `@gmail.com` or private server addresses to prevent "Address not found" loops during high-stakes project phases.

---

### 6. Synthesis of Professional Opportunities

Your search results indicate a high demand for:

- **BSc Entrepreneurship:** Focusing on technology-disruptive leadership.
- **Automotive Engineering:** Specifically in vehicle architecture, hybridization, and numerical approximation for industrial problems (ENSTA Bretagne profile).

---

### Conclusion & Final Recommendation

The data points toward a unified vision: **Technical mastery in the lab** (Transformers, Induction Motors, Magnetic Fields) must be paired with **Administrative mastery** (Market Strategy, Soft Skills).

**Would you like me to create a structured "Business Plan" template for an Engineering Startup based on the ENSAIT "SPRINT" model found in your research?**

In this lab experiment we are going to obtain the values of the parameters of the approximate

equivalent diagrams of transformers.

---

# 1. Transformer Analysis: ECE 410 Laboratory Framework

The core of transformer characterization lies in the **Open Circuit (OC)** and **Short Circuit (SC)** tests. These allow engineers to determine the parameters of the approximate equivalent circuit without loading the transformer to its full capacity.

### A. Open Circuit Test (Excitation Parameters)

Performed to find the shunt branch parameters: core loss resistance (Rc ) and magnetizing reactance (Xm ).

- **Setup:** Rated voltage is applied to one side (usually Low Voltage) while the other side is left open.
- **Key Measurements:** Voc (Rated Voltage), Ioc (No-load current), Poc (Core losses).
- **Calculations:**
  - **Power Factor:** cosϕoc =Voc Ioc Poc
  - **Admittance:** Yoc =Voc Ioc
  - **Conductance:** Gc =Voc2 Poc
  - **Susceptance:** Bm =Yoc2 −Gc2

### B. Short Circuit Test (Series Parameters)

Performed to find the series branch parameters: equivalent resistance (Req ) and equivalent reactance (Xeq ).

- **Setup:** One side is shorted (usually Low Voltage). Voltage is increased slowly until rated current flows.
- **Key Measurements:** Vsc (Reduced voltage), Isc (Rated current), Psc (Copper losses).
- **Calculations:**
  - **Impedance:** Zeq =Isc Vsc
  - **Resistance:** Req =Isc2 Psc
  - **Reactance:** Xeq =Zeq2 −Req2

---

# 2. Advanced Training Systems: The InsTrain & Lucas-Nülle Model

Modern electrical engineering education has shifted toward **independent learning** and **multimedia integration** through systems like "InsTrain."

### System Architecture

- **Multimedia Lab:** Includes interactive software, animated training modules, and PC interfaces.
- **Fault Simulation:** Allows instructors to trigger realistic electrical faults (short circuits, earth faults) for students to diagnose using industrial testers (e.g., Gossen Metrawatt).
- **Key Training Areas:**
  - Building mains feed and service entry boxes.

- Testing of RCDs (Residual Current Devices).
- Insulation and loop resistance measurement.

---

# 3. Didactic Equipment & Experimental Catalog (ZE3301)

The ZE3301 system represents a high-performance electrotechnical trainer capable of covering the entire spectrum of electrical theory.

### Highlighted Experiments from the 32-Item List:

- **Exp 7 & 8:** Verification of Kirchhoff's and Superposition laws.
- **Exp 10:** Thevenin and Norton theorem verification.
- **Exp 17 & 18:** First and second-order dynamic circuit response (RC/RLC).
- **Exp 31 & 32:** Advanced topics including **Negative Impedance Converters** and **Gyrators**.

---

# 4. Practical Pedagogy: Confection of Didactic Materials

A unique aspect of your documentation covers the "hand-on" creation of teaching tools, emphasizing that practical skills are as vital as theoretical knowledge.

### Engineering & Math Models

| Activity | Objective | Materials |
|---|---|---|
| **Tangram** | Geometry & area measurement | Cardboard, ruler, scissors |
| **Square by Folding** | Precision without tools | Paper sheets |
| **Pyramid/Prism** | 3D Visualization & Netting | Canson paper, glue, cutter |
| **DIY Compass** | Magnetism fundamentals | Magnetized needle, cork, water |

### Series vs. Parallel Circuits (Activity 8)

This practical module demonstrates the fundamental difference in electrical distribution:

- **Series:** U=U1 +U2 . If one bulb fails, the circuit breaks.
- **Parallel:** I=I1 +I2 . If one bulb fails, others remain lit.

Shutterstock
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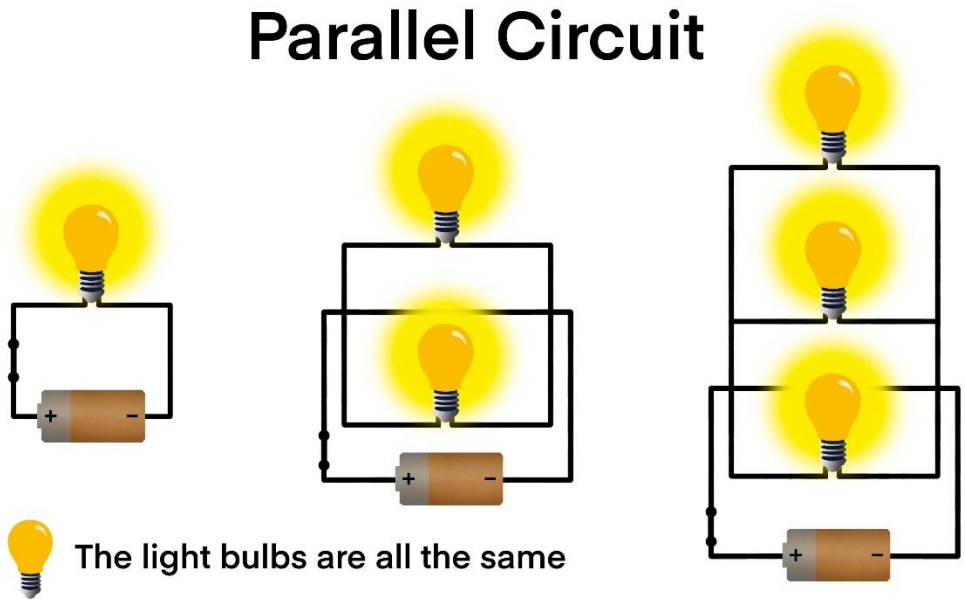
# 5. Summary Table for Transformer Report

*To be filled during your laboratory session:*

| Parameter | Unit | Open Circuit (OC) | Short Circuit (SC) |
|---|---|---|---|
| **Power (P)** | W | | |
| **Current (I)** | A | | |
| **Voltage (V)** | V | | |
| **Resistance (R)** | Ω | Rc : | Req : |
| **Reactance (X)** | Ω | Xm : | Xeq : |
| **Power Factor** | - | | |

**Would you like me to generate a step-by-step mathematical example using sample values to show exactly how to calculate Rc and Xm for your final report?**




This deep report integrates the **N2 Electrical Trade Theory** curriculum with the professional registration pathway in South Africa. It covers theoretical requirements, practical milestones, and the legal framework for becoming a licensed electrician.

## 1. N2 Electrical Trade Theory: Core Knowledge

The N2 trimester is the critical "bridge" between foundational concepts and professional apprenticeship.

### Module Breakdown & Technical Focus

| Week | Module | Technical Objective |
|---|---|---|
| **1** | **AC Theory** | Master the **Power Triangle** (Real, Reactive, and Apparent Power). |
| **6** | **DC Machines** | Understand commutation and the physical construction of motors. |
| **8** | **Transformers** | Single-phase and three-phase transformation principles. |
| **9** | **Earthing** | Adhering to **SANS 10142-1** safety standards for installations. |

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### Calculation Standards

To ensure marks in national exams, students must follow the "Four-Step Protocol":

1. **Formula**: State the original equation (e.g., S=P2+Q2 ).
2. **Substitution**: Show the numerical values plugged into the variables.
3. **Accuracy**: Round the final result to **three decimal places**.
4. **SI Units**: Append the correct unit (e.g., **kVA**, **kW**, **kVAr**).

---

## 2. Professional Registration (The Wireman's License)

Completing N-levels is the academic half of the journey. The legal right to certify electrical work requires Department of Employment and Labour (DOL) registration.

### Registration Categories

| Category | Theoretical Requirement | Legal Scope |
|---|---|---|
| **Single Phase Tester** | N1 – N3 | Domestic 220V (Houses/Small Offices). |
| **Installation Electrician** | N1 – N4 | Commercial/Industrial 380V (Factories). |
| **Master Electrician** | N1 – N5 (Minimum) | Specialized & Hazardous (Mines/Hospitals). |

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### The 5-Step Path to Licensing

1. **Theoretical Study**: Pass N1–N3 (min. 40% per subject).
2. **Apprenticeship**: 2–4 years of documented practical work under a registered mentor.
3. **Trade Test**: A practical exam at a SETA-accredited center to become a "Qualified Artisan."
4. **Installation Rules**: Pass the **SANS 10142-1** (Paper 1 & 2) exams with 50%+.
5. **DOL Registration**: Submission of your Portfolio of Evidence (PoE) for your license.

---

## 3. Career Path Comparison

It is vital to distinguish between the **Artisan/Technician** path and the **Academic/Engineering** path.

| Feature | Technical (N1–N6) | University (BEng/BSc) |
|---|---|---|
| **Focus** | Installation, Maintenance, & Testing | System Design & Project Management |
| **NQF Level** | NQF 2–5 | NQF 7–8 |
| **Accreditation** | DHET / QCTO | ECSA (Professional Engineer) |
| **Outcome** | Licensed Electrician / Contractor | Professional Engineer (Pr Eng) |

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## 4. Summary of Legal Obligations

Under South African law, a **Certificate of Compliance (CoC)** can only be issued by a person registered with the DOL.

- **Warning**: Performing electrical work for gain without registration is a criminal offense under the Occupational Health and Safety Act.
- **Insurance**: Insurance companies will not pay out for fire or damage claims if the electrical installation was not certified by a registered Wireman.

---

**Would you like me to provide a sample mock-exam question for the AC Power Triangle or a checklist of the documents required for your DOL license application?**

This integrated report serves as a bridge between your **academic training** at St. Peace College and your **professional registration** as a government supplier in South Africa. It synthesizes your

N-level electrical theory with the administrative requirements of the Central Supplier Database (CSD) and SARS.

---

## 1. Professional Profile: Tshingombe Tshitadi

You are currently transitioning from a **Learner/Student** to a **Registered Supplier**. This dual status is reflected in your recent administrative filings:

- **Institution:** St. Peace College.
- **CSD Status:** Account Created (Activation Pending/In Progress).
- **SARS Case Number:** 474178762 (Registration for eFiling).
- **Bid Reference:** R0169241870 (Submitted to Department of Education).

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## 2. Technical Case Study: Materials Recovery Unit

The **Recyclable Materials Recovery Unit** mentioned in your portfolio is the perfect "Multidisciplinary Project" to prove your N2/N3 Electrical Trade Theory competency. It combines four distinct engineering fields:

- **Electrical:** Wiring of sensors to detect material types (inductive for cans, capacitive for plastic).
- **Pneumatic:** Air cylinders used to "flick" waste into the correct bins.
- **Digital Systems:** A tablet interface and PLC logic to automate the production line.
- **Mechanical:** Conveyor belt alignment and motor torque for compacting cardboard.

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## 3. Administrative Compliance: The "Bidder's Portfolio"

To win the bid you submitted (Total Price: **R1,000,000**), the following "Standard Bidding Documents" (SBD) are legally required. Any error here renders your bid **invalid**.

### Key SBD Forms Explained

| Form | Title | Your Requirement |
|---|---|---|
| **SBD 4** | Declaration of Interest | Disclosing if you have any relationship with persons in the service of the state. |
| **SBD 8** | Past SCM Practices | Certifying that you have never abused the supply chain system or failed a contract. |
| **SBD** | Independent Bid | **Crucial:** Certifying that you did not "price-fix" with other students or |

| Form | Title | Your Requirement |
|---|---|---|
| **9** | Determination | companies. |

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## 4. Immediate Action Plan: SARS & CSD

Your SARS eFiling registration is currently in a "Waiting for Documentation" status. You have a **21-day window** (from 2023/09/23) to finalize this.

### Requirements Checklist

1. **Identity:** Clear photo of your ID/Passport.
2. **Biometrics:** A "Selfie" of you holding your ID next to your face.
3. **Address:** Utility bill or bank statement (not older than 3 months).
4. **CSD Activation:** Click the link in your email from `csd.info@csd.gov.za` to move from "N/A" to a "Verified" supplier number.

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## 5. Engineering Ethics: Avoiding Bid-Rigging

As per your **SBD 9** declaration, you must understand **Horizontal Relationships**. If two students from the same college bid for the same contract and agree on a price beforehand, it is considered **Collusive Bidding**.

- **Penalty:** Being restricted from doing business with the public sector for up to **10 years**.
- **Legislation:** Competition Act No. 89 of 1998.

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## Summary of Next Steps

Your portfolio is moving in the right direction. To strengthen your bid for the **Department of Education**, you must ensure your Tax Compliance Status (TCS) Pin is generated as soon as SARS verifies your documents.

**Would you like me to create a template for a "Technical Proposal" that describes your Electrical and Pneumatic maintenance plan for the Recovery Unit?**

This deep report connects the **academic research** into TVET Electrical Engineering with the **real-world job market** at City Power Johannesburg. It bridges the "Theory-Practice Gap" identified in the research with the specific technical requirements for employment as a shift electrician.

## 1. The Research Study: Theory vs. Practice

The provided Table of Contents outlines a significant study on the **TVET (Technical and Vocational Education and Training)** sector. The core problem investigated is the **Theory-Practice Imbalance**.

### Key Findings and Theoretical Framework

- **Theoretical Framework:** The study utilizes **Kolb's Experiential Learning Cycle**, which emphasizes that learning is a process where knowledge is created through the transformation of experience.
- **The "Gap":** Chapter 4 identifies that students struggle during practicums because the tools and materials in college workshops often do not align with those used in the actual workplace (e.g., City Power).
- **Work-Based Experience (WBE):** The research highlights WBE as the essential bridge to move a student from a "learner" to a "competent artisan."

## 2. Career Opportunity: City Power Electrician (Task Grade 9)

The Vacancy Bulletin (Ref 001) serves as a practical application of the N2 qualification discussed in previous reports.

### Minimum Appointment Requirements

To be eligible for this **R350,966** per annum position, an applicant must possess:

1. **N2 Electrical Engineering Certificate.**
2. **Electrical Trade Test Certificate** (The "Qualified" status).
3. **Experience:** 3 years in electrical distribution.
4. **License:** Valid Code C1 with a Professional Driver's Permit (PrDP).

### Core Technical Competencies Required

| Task Category | Specific Requirement |
|---|---|
| **Maintenance** | Transformers, motors, and electrical controllers. |
| **Network Ops** | Repairing LV (Low Voltage) and MV (Medium Voltage) underground/overhead networks. |
| **Diagnosis** | Using test instruments to find malfunctions in large power systems. |
| **Safety** | Compliance with SHEQ (Safety, Health, Environment, and Quality) and legislation. |

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## 3. Procurement & Compliance: RFQ for Trade Test Panels

The City Power "Request for Quotation" (RFQ) highlights the industry's need for updated testing standards.

- **Objective:** To assess and update the existing **Electrician Trade Test Panels**.
- **Significance:** This ensures that the "Trade Test" (the final hurdle for any student) remains relevant to modern technology used in the field.
- **Mandatory Requirement:** Any service provider must be accredited by **NAMB** (National Artisan Moderating Body) or the relevant **SETA**.

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## 4. Technical Specification: Portable Earthing Equipment

As highlighted in Module 9 of the N2 curriculum and City Power Reference **CP_TSSPEC_108**, earthing is a critical safety component.

### Safety and Short-Circuiting

Electricians at City Power must use **Portable Earthing Equipment** when working on de-energized lines to prevent accidental re-energization.

- **SAP Item 3551:** Refers to the "Panel Portable Earth Equipment" used for earthing and short-circuiting.
- **Deviation Schedule:** Contractors must prove that any deviation from the City Power specification is more cost-effective without compromising safety.

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## 5. Summary: From Student to Professional

The transition path is now clearly defined by these documents:

1. **Academic:** Complete N2 Theory at a TVET College (St. Peace College).
2. **Research:** Acknowledge and overcome the theory-practice gap through active workshop participation.
3. **Apprenticeship:** Gain 3 years of experience (as required by City Power).
4. **Trade Test:** Pass the assessment on the modular panels (subject to NAMB standards).
5. **Employment:** Register with the CSD and SARS to apply for Grade 9 positions at utilities like City Power or Eskom.

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**Would you like me to help you draft a "Motivation for Study" or "Problem Statement" based on Chapter 1 of the research for your own portfolio?**